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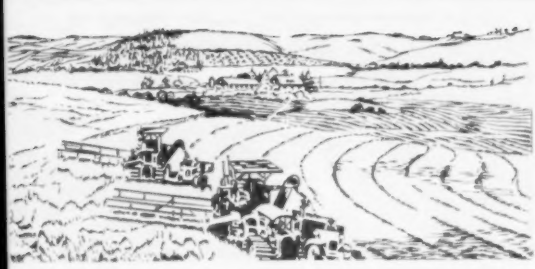

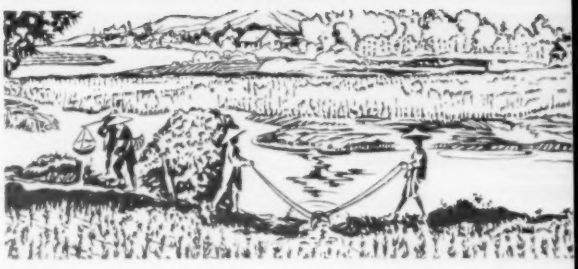

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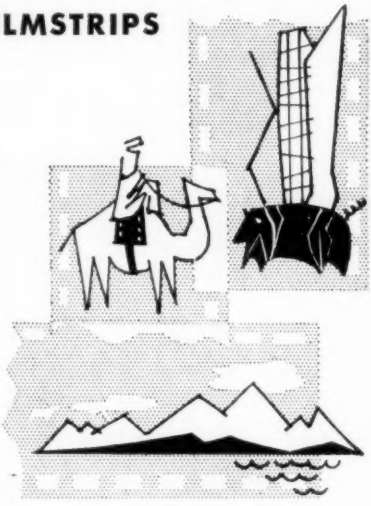

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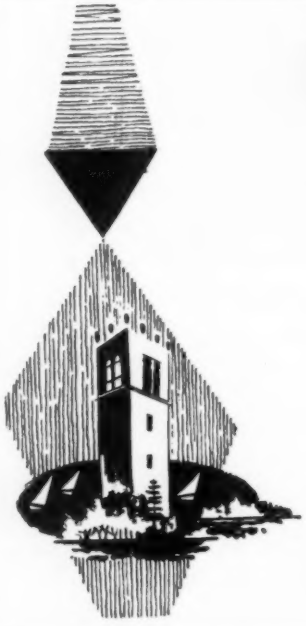

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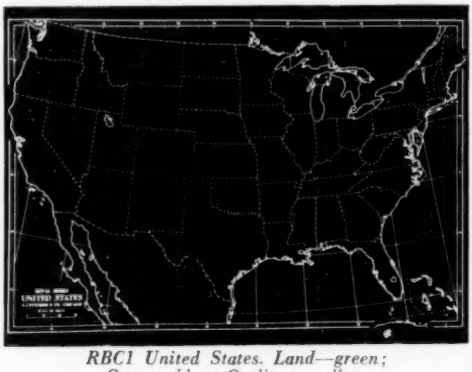

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VOLUME LVI MARCH 1957 NUMBER 3

RESOURCES FOR THE FUTURE, INC. AND RESOURCE USE EDUCATION*

EDWARD A. ACKERMAN†

THE PLACE OF FOUNDATIONS IN PRESENT AMERICAN RESEARCH AND EDUCATION

Within the last twenty years private foundations devoted to public spirited objectives have become an increasingly prominent part of the American scene. In days past the private support of special activities in education, research and related activities was mainly associated with the name of wealthy individuals. While the names of the great families are associated with the foundations, the business of managing private funds for public purposes increasingly is in the hands of foundation trustees and executives. There now are estimated to be about 7,300 foundations in the United States.[1] Between 1940 and 1955 foundations were being formed in the United States at the rate of 220 a year. The annual expenditures of 3,795 of them who report their work publicly was estimated in 1955 to be $371,367,000.[2] While $371 million is not large by comparison to the total educational budget of the United States ($15,544,000,000 in the school year 1955-56), it still represents a significant influence on the research and educational picture. Of course not all the foundations devote their funds entirely to education and research. However, if one considers the interests and programs of the larger foundations like Ford, Rockefeller, the Carnegie Corporation, the Kellogg Foundation and others, education and research expenditures probably are a dominant part of the $371 million total.

* Discussion presented at meeting of National Council of Geography Teachers, Atlantic City, N.J., November 23, 1956.

† Director, Water Resources Program, Resources for the Future, Inc.

[1] Wilmer S. Rich, *American Foundations and their Fields*, 7th Ed., N.Y. 1955, p. xiii.

[2] *Ibid.* p. xxiv.

RESOURCES FOR THE FUTURE, INC. INTERESTS AND ACTIVITIES

I have been asked to tell you a little about the activities of my own foundation, Resources for the Future, Inc. This foundation was established in 1952 as an autonomous fund financed by The Ford Foundation. Its purpose officially has been described as "to foster, encourage and conduct scientific research, with special emphasis on the social sciences, in the natural resources and conservation, wise use of development of such resources; to publish, disseminate or make available the results of such research and study, and otherwise to foster, encourage and improve knowledge and education in such field."

Resources for the Future is neither a large nor small foundation. However, I was somewhat surprised a few days ago to find that it ranks among the top 16 per cent of United States foundations from the point of view of size of assets, as they were reported in 1954. Most of the foundations are astonishingly small. Indeed there is one foundation among the 4,000 plus which in 1955 listed total assets of $177.00.[3]

If one looks over the operations of the numerous foundations there seem to be three different types: 1) One type makes grants to other organizations or to individuals; 2) A second type conducts research or provides services under the auspices and administration of the foundation itself; and 3) Both grant-making and research operations may be conducted within the same institution. Resources for the Future is of the latter type. We have a small operating research staff of about thirty professional people at the present time, with a well-defined research program in the fields of water resources, land use, energy and mineral resources, regional studies, and economic growth. Both the regional studies and the economic growth research are oriented in the direction of natural resources. In these same fields we also have a grant-making program thru which we support research sponsored by universities or other educational institutions. During our two and a half years of operations we have made thirty-five such grants and concluded six "research agreements." The total amount of funds involved in these forty-one projects was about $1,106,000. Under our present operating funds, the greater part of our grant-making capacity has now been used. The amount remaining for future grants within these funds is relatively small.

[3] *Ibid.* p. 344.

THE RESOURCES FOR THE FUTURE STAFF

If you were to look over our staff, you would have to search hard to find anyone even remotely resembling Sloan Wilson's "Man in the Grey Flannel Suit," or the type called "philanthropoids" by the *New Yorker* magazine. Most of the staff are specialists with considerable experience and professional recognition in their field. About a third have held university professorships or are on leave from such posts at the present time. All of the remainder have held responsible positions, either in Government agencies or in private research organizations like the National Bureau of Economic Research, or the Rand Corporation. The bulk of the staff is composed of economists, but we have political scientists, regional planners, geographers and engineers on the staff.

I believe I can speak for all in saying that the professional staff has found its service with Resources for the Future a stimulating, and thus far rewarding experience. Within certain time limitations we have the pleasure of following our own bents in research. There is the challenge of working out a program of research which does not duplicate governmental or other research institution activities. There is in addition the stimulus of remaining alert enough to recognize educational "gold bricks" when they are presented to us, and also to be alert enough to see one diamond among a confusion of promises.

This latter side of our work is not without some amusement. We once received a research proposal for money to be expended by a single individual to the amount of five hundred million dollars, more than a hundred times our total assets! Only last week I listened to a proposal in which the petitioner suggested that for the expenditure of about a thousand dollars, Resources for the Future might bring final benefits to the nation of around 20 to 30 billion dollars! In spite of this extremely favorable benefit-cost ratio, we did not make the grant.

RELATIONS TO THE FIELD OF EDUCATION

One of the phases of our work that most of us enjoy especially is our close relation with the field of education. We interpret this broadly, for we feel that the support of research may be the foundation of teaching in the future. However, we also have projects which are directly concerned with teaching in the resource-use field. Our plans and our practice at the present time include

the following specific relationships with the educational world.

First, we have and will have educators and university research workers on our staff on a temporary basis. The purpose is to give promising people with interests in the field an opportunity to study, to share their specialties with us, and to extend their grasp of their chosen field.

Second, we have provided and are providing financial support for research projects of regional importance to universities. The purpose of these grants is to enable the institutions to attract staff, to develop a philosophy, and regional leadership in the field. Examples of such grants are those made in the last two years to the University of New Mexico and to the University of Kansas. The University of New Mexico will study and attempt to measure the value of water for different uses, particularly industrial and agricultural, within its state. This is a subject of great importance in planning the use of water thruout western United States. The University of Kansas on the other hand has just completed, with our support, a preliminary planning study for the use of the Kansas River. This was, in our view, a pioneering venture in planning the water resources of a tributary basin on the Plains.

A third way in which our program touches education is thru the support of graduate or faculty seminars within universities. We have done this at the University of Chicago in a three-year grant for a seminar on Federal Programs and Policies touching government ownership of land and water resources. Support of a seminar at Harvard University on land use similarly was conducted for several years. Also, a part of the University of Kansas project mentioned above was support of a seminar which enabled faculty members to meet and exchange opinions, as well as to conduct joint planning.

A small but important part of our program has been awards for the support of research on Ph.D. theses to Ph.D. candidates in a number of institutions, where their interests touch the important fields of resource use investigation. We have also supported a portion of the inter-university case study program. Three of these studies will appear with our support, one on the location of the Bowaters Paper Plant in Tennessee, the other on the Echo Park Dam controversy, and the third on planning for the Arkansas-White-Red River Basins. They should be good source materials for university, and possibly other teaching.

INTEREST IN PRIMARY AND SECONDARY SCHOOL PROGRAMS

The project of most interest to you probably would be that which concerns resource studies in the public schools. In 1955 we made a grant of $100,000 to the Joint Council on Economic Education for the purpose of encouraging an expansion of conservation and resource use education in the public schools. The objective, summarized, is one of getting more factual attention to resource conservation problems and introducing ideas of the influences of new technology upon conservation. The Joint Council has undertaken to set up seven pilot projects located in different sections of the country, representing different natural resource combinations of economic significance. These are in Seattle, Washington; Minneapolis, Minnesota; Dayton, Ohio; Hartford, Connecticut; Chattanooga, Tennessee; Webster Grove, near St. Louis, Missouri; and Lexington, Alabama. In each instance a local committee, representing school administration, participating teachers, college representatives, conservation agency representatives, and representatives of management, labor, parent-teacher, agriculture, and women's organizations are included. There is a national coordinator for the program, and a national advisory committee.

The program has included a summer workshop during each of the last two summers. The first of these was held at Yale University and this summer's was located at Antioch College in Ohio. The 1955 Resources for the Future Annual Report notes that "By the end of 1957, the Joint Council hopes to have built up a series of well tested programs for the in-service training of teachers in natural resource and economic education. It will have assembled concrete examples of curriculum programs at various school levels and have collected tested study materials."[4]

GEOGRAPHY AND "SOCIAL SCIENCE"

I think it is obvious that this project in particular is of interest to teachers of geography in both secondary and primary schools. They were among the very first in our educational system to recognize the importance of resource use education and have long included it in their program of instruction. However, our relations with the directors of this project have brought out an interesting problem which now appears to face those interested in teaching

[4] Resources for The Future, Inc., *Annual Report*, Washington, 1955, p. 41.

geography. I am told that all over the country geography is disappearing into a curricular omnibus known as "social science." Some of you may feel that this is a desirable trend. On the other hand, I am equally certain that a number of the members of the National Council look upon it not only with misgivings but with downright disapproval. In closing, I should like to say a few words about this problem in particular, and about the possible relations of foundations to it.

I should like to look at this problem, not so much from the point of view of the teaching of geography alone, but from the point of view of adequate preparation of future citizens and professional people. We might say that there are four basic ways in which men communicate with one another. They are ways in which we express our ideas, emotions, observations and accumulated knowledge. Music is one, words another, numbers still another, and finally what we might call graphic portrayal. Thus there is a language of words; there is a language of numbers, or mathematics; and in a sense there is a language of graphic portrayal which includes sketching, photography, the architectural or engineering plan, and maps. These are basic tools in organizing and making use of knowledge and ideas as they affect the progress of mankind.

I am sure that I need not argue here my view that the map is a most important instrument of graphic portrayal. It is the basis of all organized knowledge about the surface of the earth. Without a knowledge of mapping techniques one is incompletely equipped to understand the theater within which the human drama is played.

Thus we have our problem: In grouping geography with a general subject of coordinated social science, does education neglect developing a basic understanding of one of the languages used in communicating knowledge? Quite candidly we cannot claim the same primary place for it that the languages of words and of numbers have. But the language of cartographic techniques and the science which has been built on those techniques still is basic. How is it best to be made a part of the training provided in primary and secondary education?

To the best of my knowledge this question has not been investigated thoroly from the point of view which I am attempting to describe. I believe it is an investigation, however, which must pro-

ceed on the initiative of geographers. Finally, it is the kind of question in which one of the many foundations in the United States should find an interest also. I can speak safely in this vein since I have already told you that nearly all of Resources for the Future's present funds are committed otherwise.

The techniques of geography make it something more that a social science. To know this would seem important to future American understanding of resource use, international relations; to regional planning, engineering, and other professional work. I hope that some of you will think over the potential significance of research on the question I have described. An understanding of this problem may have significant influence on the efficiency and the breadth with which future American diplomats, government and business administrators, engineers, planners and other professional people are trained and educated.

TECHNIQUES FOR TAKING COLORED GEOGRAPHIC SLIDES

FRANK AND MARYLIN KELLAND
Aeronautical Chart and Information Center
St. Louis, Missouri

Colored slides, provided they are carefully planned and executed, are ideal aids for teaching geography. In the opinion of the authors, there is no better medium for bringing the landscape to the classroom. The degree of skill required for such photographs can be easily acquired. During several years of trial and error slide-taking we have established some principles which we feel might be of use to other geographers.

ESSENTIAL EQUIPMENT

The equipment needed includes a 35mm camera in the moderate price field, along with supplementary items which are well within the financial means of most geographers. A reliable light meter is essential for taking both direct light readings for outdoor photography and incident readings for indoor work. A small sturdy tripod and a wide-collared cable release are most useful for time exposures. For illuminating features in shadow, or for quick shots in poor light, a flash attachment with fresh batteries is necessary.

We have found portrait lenses excellent for photographing de-

tails of such things as dwarfed vegetation and other minute specimens in the field, and for small maps and specimens in the lab. A steel tape and a tiny carpenter's level are also useful for portrait work. A watch with a sweep second hand is helpful in making time exposures. A haze filter helps cut fog, smog, or mist. No other filters are really necessary for usual colored geographic slides, since the natural color is the one the geographer tries most often to portray. The portrait lenses and the haze filter may be held in place by a sun-shade, which also protects the camera lens from the direct rays of the sun—a frequent cause of orange stripes in the finished transparencies.

All the mentioned equipment except the camera will fit nicely into the pocket of a field pack. The camera should be carried by its own strap so that it will be readily available at all times. A gadget bag is not necessary for field photography.

When you plan a trip with photographs in mind, be sure that you know how to operate both your camera and light meter properly and that they are both in good working order. If you haven't taken any slides in some time, or if you have a new camera, run thru a small trial roll of film and have it developed before you leave home. One geographer we know photographed her way thru the Canadian Rockies with a broken range finder and lost seven rolls of film—over 200 potential pictures!

Watch for condensation of moisture on the lens of your camera when you take it from one temperature to another. Try to allow time enough for the temperature of the camera to become adjusted before you begin to shoot. This is especially important when you are making underground pictures in caves and mines and when going indoors in winter.

Camera Settings

Altho you should ordinarily rely on your light meter, don't be afraid to experiment with exposures occasionally. Be especially careful of exposures made at the seacoast, in the mountains, under snow conditions, and on cloudy-bright days. As a rule a cloudy sky indicates the use of a wider lens opening than would be used on a sunny day; however, thin clouds or haze sometimes reflect so much diffused light that the lens openings should be even less than in sunny weather. For example, we took some pictures at Niagara Falls on a hazy day, using colored film with an ASA rating of 10,

with an exposure of f8 at 1/300 of a second, and the results were excellent. Incidentally, light conditions of this type often provide even illumination for such subjects as undercut open-pit mines and quarries which are too much shadowed in bright sunlight for even exposure at any time of day.

If conditions are such that your meter doesn't indicate any exposure which will give you a good picture, and you can't wait or return for better light, try to get the picture anyway. Sometimes you'll be pleasantly surprised at the results. If the light is too poor to get a reading for an instantaneous exposure and you can't take a time exposure, open the lens wide, set your time as slow as it will go, and shoot from a firm position. Most films have more latitude than the conservative ratings given them. There is seldom only one "correct" exposure to give you a good picture.

Don't be afraid to take occasional pictures in the early morning or late evening. Film instructions warn that an orange tint will result in early or late pictures, which is quite correct; but orange is a color which appears naturally under sunrise and sunset conditions, and therefore it is not entirely undesirable in a slide. One of our most striking pictures is of an oil derrick on a hill in Pennsylvania. It was taken just after sunrise under almost impossible light conditions; the result is a slide which has both artistic composition and geographic significance.

Don't always try to make your slides of the blue-sky-sunny-day variety. It is easy to change exposures to fit varied light conditions with even a low to moderate priced camera; and, since the geographer deals with the landscape in all its phases, nature should be shown in her grey moods as well as her sunny ones. Slides which are of necessity under-exposed will often project very well with a powerful projector.

If you are wearing colored glasses while taking pictures, be especially careful to read and follow your light meter. You will see thru your sunglasses a darker view than is actually present, and the danger of overexposing is great.

You will find that outdoor film is best for general usage, and it can be used for exposures with blue-tinted blubs for flash photography. Indoor film is best, however, for work with maps, illustrations, or specimens when the entire film is to be exposed under artificial light. Select film carefully for its exposure speed and color qualities. There are several brands of 35mm color film on the mar-

ket, some of which are "faster" than others—that is they will produce better slides under poor light conditions in a given exposure time. Some films tend to add blue tones to the finished slides while others add red or green tones. Beware of so-called film and processing bargains; they are often false economies.

Decide on one type of flash bulbs and use them consistently. After some experiments and calculation, a list of the best exposures at varying distances with flash bulbs should be made on adhesive tape and taped to the side or back of the camera where it will be available for immediate reference.

Photographing Small Details

Some maps and illustrations are too small for classroom use, but they are excellent teaching devices. Perishable and fragile specimens are hard to use in the classroom. These can all be easily photographed and presented on the screen. Photograph such materials under carefully controlled conditions if you can. For example, hailstones can be gathered immediately after a storm and stored in the freezing compartment of your refrigerator so that you may photograph them at your leisure.

Small maps and illustrations are better for reproduction in slides than large ones because their projected images are larger than the original subject, and detail will be easily shown on the screen. For such exposures take careful light readings and be sure the light is even. Use portrait lenses if necessary to fill the frame of the slide with the image of the subject. Be sure that the camera lens is centered directly on the center of the subject, and measure lens-to-subject distance carefully when using portrait lenses. A fraction of an inch can make the difference between a good reproduction and a blurred one.

Field Work with the Camera

Ideally you should have your camera with you at all times for pictures which would otherwise be lost. However, if you go out in the field for the specific purpose of acquiring some good slides, plan your expedition carefully. The best method is to make a reconnaissance and note details you would like to photograph. This will help you to find good examples of various features. After you have gone carefully over the area once, use a map to route your second trip. Make a checklist of the slides you want to take; then go out

and shoot your pictures, checking them off as you proceed. Budget your film—don't waste your last picture on something of minor importance just before you find your best photographic opportunity of the day!

It's a good idea to contact the proper persons before trying to enter private property for photographs. Unfortunately geographers are no more immune to dog bites and buckshot than ordinary people! If you make the necessary contacts, you will ordinarily be permitted to take all the pictures you want; and you may have a willing source of information in addition. Most of the people you meet will be interested in your work and will want to help.

PHOTOGRAPHIC COMPOSITION

Get close enough to your subjects to have them seen in the finished slides. Most family albums abound with photographs of people just visible in the far distance, and the same is true of many amateur slides. What you see in the finder window of your camera will be approximately what you will see in the finished slide. Learn to know your camera well enough so that you will know in advance if your slide will have more on the right or left than you can see in the viewing window.

When you are photographing closeup details, be sure that you also include a general view to show the complete subject in relation to its natural setting. Try to imagine how complete a mental picture you would get from your slides if you hadn't actually seen the subject yourself.

Show scale in your pictures if it is not self-evident. For example, a group of ordinary buildings would not require any additional scale, but an erosion feature might. There are many satisfactory objects always available for scale, and their use depends on the size and nature of the subject. Coins are excellent for use in small-scale pictures, as are pencils, fountain pens, and pen-knives. Geology hammers, chisels, binoculars, field packs, notebooks, gloves, hats, and sunglasses are all useful in this capacity. People can be used to show scale effectively. In this case, recognition of the person is unimportant, so he may be placed far from the camera if necessary, to show a large feature; or he may be shown only as a partial profile at the edge of the picture, perhaps looking at or pointing to the subject. In choosing an object for use as scale, be

sure that it will be familiar to the viewers of the slide, and that its color, size, and shape neither blend into the background nor detract from the subject of the picture.

Try to give your slides eye appeal by balancing the scientific with the artistic. The teaching quality of your slides will be far greater if they are pleasantly composed. Consider the monotony of a series of slides which show open fields or water with a horizon and unbroken sky above. There is nothing to make a depth transition between the viewer and the distant landscape. Try to provide a natural frame, such as the trunk and branch of a tree, in the foreground of a landscape shot. Eye appeal may be added by the use of color. A drab landscape can be brightened by including green leaves, wildflowers, or perhaps a person in a bright shirt or jacket at one side of the picture. Again, be sure not to detract from the subject of the slide.

Color and texture of rocks can be brought out by splashing water on them. This method will also deepen contrast to show letters on dark metal plaques or on rock monuments. Shadows, snow, or fog may outline subjects which would otherwise be hard to photograph. One slide in our collection shows Tuckerman's Ravine on Mt. Washington, New Hampshire, outlined perfectly by fog. The U shape of the cirque, shown so well by the fog, would be blended into the dark vegetation and rocks of the headwall in clear sunlight.

Photograph from the best possible angles to show what you want to portray. Towers and high buildings are excellent for general pictures. Cities usually offer such vantage points; Tribune Tower in Chicago and the Empire State Building in New York are good examples. In the country excellent views may be had from fire towers. If the feature you want to photograph happens also to be a tourist attraction, look at the picture post card views. They will often give you an idea of where to find the best points from which to photograph. Don't lose geographic value in your slides—sometimes the tourist view is not the best for your purposes.

Statistics and diagrams are frequently posted on signboards at the sites of dams or other public works. In recreation areas signs often show the names of rivers or mountains. All of these features can be photographed with their identifying labels to provide good introductory slides for series, or to give you ready reference to background information.

Panoramic views can be taken by standing in one place and tak-

ing overlapping slides. Be sure that the pictures overlap enough so that features at one edge of the first slide can be recognized at the opposite edge of the next slide and so on. Check exposures for each slide of a panoramic series.

SHOWING THE DYNAMIC LANDSCAPE

Changing and moving aspects of the dynamic landscape can be shown effectively in slides. Take pictures of vegetation in different seasons to show climatic effects. The capacity for showing seasonal and altitudinal vegetation changes is a major advantage of color slides over black and white. Show cloud build-ups by shooting pictures at intervals while the clouds change. Show people in action —tractors with the dust of the fields rising behind them; farm workers harvesting sorghum; hikers climbing; miners at work. The idea of movement can be conveyed in many ways. Show change in a city or a system of transportation by photographing old pictures or prints for comparison with slides of the features as they appear at present.

Be on the lookout for "type" pictures—typical geomorphological features of loess, karst, glaciation; typical crop combinations; ethnological types; soil profiles. Good type pictures are probably the most valuable of all slides used in teaching.

EXPOSURES FROM AN AUTOMOBILE

There are a few points it may help to remember when you are taking pictures from an automobile. If the automobile is moving, be sure to speed up the exposure to take away the blurr which may otherwise result. If you can't decrease your exposure time, you might try "panning"—moving the camera in the same direction as the car is moving while the exposure is snapped. This sometimes gives a clearer slide, but is rather tricky. If you stop to photograph something from the car, turn off the motor to prevent blurred images resulting from vibration. The same holds true if you use the hood or window frame of an auto in place of a tripod for a longer exposure.

RECORDING FOR FUTURE REFERENCE

A field notebook is invaluable for recording information about slides as you take them. Don't depend on your memory and wait until you get back home or to the office to jot down information. Try to record each exposure immediately after you take it, unless

conditions are such that you can't. Don't worry if you can't get the information written—the slide is the important thing. However, complete information not only helps you to identify each slide, but to overcome your weaknesses in photography. If poor slides are checked against the statistics of camera settings in your notebook, you will know what to do or what to avoid doing under like conditions in the future.

We use a little looseleaf notebook for our field record. It has ruled pages with the following columns: exposure number, subject, place, date, time of day, f stop, time setting of lens, remarks, and a number column which indicates the numbers of the slides which we keep in our collection, or an "X" if a slide has been discarded because of poor quality, or a "D" if a slide is a duplicate which we intend to trade or to give away. The notebook is small—about $3\frac{1}{2} \times 5\frac{1}{2}$"—and it will fit easily into a jacket pocket or over the visor of the car. Incidentally, we find that the slide notebook makes an excellent diary with a good record of our field expeditions.

An automobile speedometer can help you to record photographs taken along a road on which there are few definite landmarks, such as intersecting highways, to give you exact map location. Take mileage between photographs, then relate the mileage to a known point, and you will be able to keep an exact record of where your pictures were taken. The record may be kept on a road map, in your notebook, or, preferably, both.

Have a mental checklist to use as you photograph. Ask yourself the following questions before you shoot: Did I check range, f stop, and speed? Am I taking my picture from the best possible position? After you have taken the picture ask yourself: Did I roll the film ahead? (This prevents double exposures if your camera doesn't have an automatic check.); Did I record the necessary information? If you make this a habit, it will soon become automatic, and you will be well on your way to a slide collection of high quality.

Above all, enjoy your slide-taking. Your camera will become a constant companion and one of your most useful tools in your geographic endeavors. Keep your photography in its place however; remember that you are a geographer and not a photographer. As a geographer you are able to select features which are representative of the landscape; with your camera you can capture those features to present to your students.

THE IMPACT OF AIR POWER ON GEOGRAPHIC EDUCATION*

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In view of the continuing advice that teachers of geography should emphasize significant aspects of air transport in the classroom, the title of this paper seems trite. For nearly twenty years, titles of our maps and texts have borne the words "global" and "air-age," and we have been warned often against the evils of the Mercator-type map projection in the schoolroom. In attempting to break thru this shell of land-bound thought, we have emphasized the role of great-circle routes in air and in maritime transportation. Much interest in the air aspects of geography was fostered by textbook and map publishers, who seemed convinced that any map or text having the word "air" in its title must necessarily be up to date.

I maintain that this is not enough. Pedagogic emphasis on great-circle routes and a round damning of the Mercator projection are slight evidence of so-called "air-age" geography, even when our text titles involve that expression or the word "global."

A review of the impact of aviation on geographic teaching over the last two decades brings familiar subjects to mind—the introduction of a variety of map projections, changing trade routes, the growth of aviation meteorology, the marketing of perishable commodities by air, the control of plant diseases on intercontinental air routes, and other topics related to geography. In parts of the earth, landscapes have been conspicuously transformed by the addition of airfields, aircraft plants, or radar installations. To a degree, the effects of aviation are apparent on the face of the land. With each year come changes in population distribution, new factory locations, new industrial products, and other evidences of the relationships of aviation and geography.

But the title of this paper—"The Impact of Air Power on Geographic Education"—implies a much more comprehensive approach to the subject. Most aspects of geography in relation to

* This paper was presented at the Atlantic City meeting of the National Council for Geographic Education on November 25, 1956. I am indebted to Mrs. Vernell Eberhard, Mr. James Thompson, Mr. William Seiter, and Captain William Hrabko, U. S. AFROTC, for suggestions and assistance in the preparation of the paper.

aviation previously referred to are passive, and tho they may be important, a more positive approach is needed.[1]

Air Power in Geographic Literature

To a certain extent, increasing evidence of the significance of aviation or air power in the geography field appears in a small number of articles and books. The writings of Glenn Cunningham, Arthur L. Burt, R. Ogilvie Buchanan, Homer Aschmann, G. Etzel Pearcy, and John Wesley Coulter represent much of the attention given to the subject by geographers, but most of the literature concerns itself with commercial air activities rather than the political implications of flight. The map of world air transport published by the National Council is a worthy step in the right direction, but search of geographical periodicals for material on air power yields negative results. One short article on the political geography of Gibraltar, published in 1952, emphasizes the naval importance of "The Rock," with only casual comment on the inadequacy of its air strip. The author ignores possible economic or military isolation of Gibraltar under air attack, or the unimportance of Gibraltar in relation to military or peacetime air routes. Not one of the sixty-six articles published by the National Council in "Geography in the High School"[2] deals directly with air transport, tho some of the authors include outlines of paragraphs that touch lightly on the subject.

The college-level political geography texts, which we use in training teachers of geography, are highly unsatisfactory in regard to air power. Their authors are unaware of its importance. The most widely-used political geography text devotes one short paragraph of six sentences to a comparison of land, naval, and air power, but an entire chapter to the political significance of international boundaries. A second text, published in 1954, contains less than two pages on matters of air transport, and thus manages to get slightly off the ground.

In comparison, geography texts used by the elementary teacher

[1] Air power is ". . . that power that arises from man's ability to fly in a vehicle or to cause a vehicle to go thru the air or thru space, and to exploit in lesser or greater degree the complex relationships that result from this ability, as in "to understand air power is to lay the foundations of peace.'" United States Air Force Dictionary, 1956, p. 34.

[2] "Geography in the High School," arranged by the Committee on High School Geography for the National Council of Geography Teachers, Bloomington, Illinois, 1949.

are generally cognizant of air transport matters. Of three sixth-grade and one fifth-grade texts examined recently, two dealt adequately with aviation; the third and fourth contained almost nothing on the subject. None of the texts included any material on pilotless aircraft or guided missiles, tho it seems probable that those are subjects of profound interest to fifth- and sixth-grade boys.

"Geographical Approaches to Social Education," the 19th Yearbook of the National Council for the Social Studies, a compilation of the writings of a number of geographers published in 1948, contains only casual references to aviation and air power. A statement on page 25 points out the freedom with which air routes may be planned in comparison to land and sea routes. It concludes with this significant statement: "This enhanced mobility accentuates both the danger of friction and the hope of mutual understanding." Except for this slight gesture toward flight, the compilers of the volume avoided anything but occasional references to air travel until page 224, when the study of the economic aspects of air transport is recommended for the junior high school curriculum, leaving world transport patterns (that is, land, sea, and air) for the secondary school student. I submit the view that this casual treatment of air geography at secondary levels is wholly inadequate to meet the needs of our present-day civilization.

Most writers in the 1954 Yearbook, "Approaches to an Understanding of World Affairs," are more conscious of air transport and air power. A few statements from this source read as follows:

> "The homeland of the United States provides the only effective base from which an attack to beat back an aggressor could be launched. . . . A half million people fly over the North Atlantic in a year. . . . Distances have shrunk in the air age. . . . Continental isolation is not what it once was."

Were these words written by geographers? Not at all. The authors' backgrounds to a man were outside the field of geography. The article on South American transportation, written by a ranking member of our profession, includes nothing whatever on the air transport of that continent.

My interest in calling the attention of geographers to the need for the study of air power was aroused several years ago when I learned that Air Force officials were dissatisfied with the geographical subject matter provided for their officer trainees. While it is true that the military view of air power and its relation to

geography may stress certain particular aspects, it does not follow that the military and non-miltary approaches are incompatible or in conflict. Some of our earlier concepts, particularly in political geography, need to be up-dated as the result of increased military and peacetime air transport. To demonstrate, let me suggest several traditional viewpoints in the teaching of geography, and the effects of air power upon them.

Air Power and Strategic Location

In the first place, air power, both military and non-military, is changing our attitudes toward location. For centuries past, geographical research and teaching have stressed the importance of strategic location. At various times in history, Venice, Istanbul, Suez, Singapore, Gibraltar, Panama, Cape Town, Magallanes, and St. Gotthard have been famous as focal points in connection with major transportation routes by land or sea. Some of these localities have long since become unimportant, and it is apparent that others are less significant today than a generation ago. Partly, at least, these changes result from increasing use of aircraft and decreasing use of other modes of transport. Of what significance is the St. Gotthard Pass and its famous tunnel to thousands of passengers en route from London to Rome, flying at altitudes greater than 15,000 feet?

It would seem that re-evaluation of the traditional strategic site—the narrow strait, the isthmus, isolated islands, and mountain passes—is in order. In the light of present-day air power, altitudes, speeds and distance potentials, a Thule may well outrank Gibraltar, and a Fletcher Island or an Iceland may be more significant than Sicily or Formosa. To quote R. H. Fifield, writing as long ago as 1944, "The development of air power has recently resulted in a new emphasis on location. The polar areas of the Arctic, an inland sea of the Atlantic, may become very important in an air age. . . . Air power may turn many of the valueless wastes of the Arctic into strategic locations."[3]

Air Power and National Boundaries

Secondly, there are indications that changes in geographic education are needed to take account of the diminished importance

[3] R. H. Fifield, "The Geostrategy of Location," Journal of Geography 43:301, November, 1944.

of international boundaries, and possibly even of the political units that they define. With high-speed aircraft it is difficult to be certain of the positions of national boundaries from the air. Tho international jealousies and rivalries may establish invisible barriers such as the Iron Curtain, these restrictive features must eventually give way to public demand that the full force of air power be utilized for the good of all nations. Is it too much to expect that the boundaries of an Israel and an Egypt may, in the next century, be as undisputed as those of Canada and the United States?

Already there are signs that the former iron-clad regulation of national boundaries is weakening. If customs unions, reciprocal trade agreements, joint operation of shipping facilities, and similar practical handling of national boundary problems can be accomplished, why not recognize the advantages of unrestricted movement of aircraft, and reduce the number of barriers to international communication? The trend in this direction becomes more pronounced each year, whether we like it or not and in spite of our national distrust engendered by Pearl Harbor. At air speeds of 1,900 miles an hour, the trip from Atlantic City to Philadelphia will take just one and two-thirds minutes. Flight from London to Vienna would occupy less than a half hour but would cross four international boundaries in that brief space of time. On such a trip, the entire length of Belgium would be traversed in six minutes. How can we continue to maintain the fiction that international, state, or provincial boundaries are going to remain significant in the face of these advances in the air? And should we not have this in mind during the course of daily classroom sessions as we struggle to convey the meaning of geography to each student?

AIR POWER, BUFFER STATES AND BUFFER SEAS

The political map of the world, particularly of the eastern hemisphere, is a jig-saw puzzle in which many pieces are small but nonetheless sovereign states. Some were established as so-called "buffer states" to serve as political shock-absorbers separating nations of greater military and economic strength. Traditional examples of small buffers include Belgium, Austria, Czechoslovakia, Ecuador, Korea, Switzerland, and Hungary. Larger nations whose geographic position and character give them the role of buffers include Turkey, Poland, and Yugoslavia. Until the advent of thermonuclear weapons, deliverable on target by air power, these

political fragments absorbed economic and military shocks started by disputes among neighboring powers. Today, however, buffer states cannot defend themselves against invasion by land or air, so they no longer impede well-planned and organized military activities. They cannot delay air attack, and their small size hardly provides them with a respectable nuisance value. This was the logical conclusion of the late Dr. George Renner, when during World War II he aroused caustic replies to his suggestion that certain nations had outlived their usefulness.

There was a time when nations with coastal boundaries could defend themselves against invasion by sea, but air power has reduced that factor of safety. A large expanse of water is no real barrier today, tho it may interfere with free movements of large numbers of people and freight tonnages as well as invading navies. In the dead of winter in January of 1956, when traffic was at its lightest, 150 passenger flights a week, or more than 20 a day, were made on the North Atlantic run. At peak travel in August, 1955, flights averaged 240 passenger air service frequencies a week, or almost 35 a day. For all commercial intercontinental routes connecting six continents in January, 1956, the weekly flights totaled 540, or 77 daily flights involving extended routes over the open sea. All but 12 of the 540 scheduled flights took place in the northern hemisphere winter season.[4] Obviously the seas are not significant barriers to communication and transportation.

Since ancient times, the inhabitants of remote continental interiors have felt themselves secure against invasion by land—a concept long held by proponents of various "heartlands." Today there are no good refuges dependent upon mere distance. At speeds of 1,000 miles an hour or more, any part of the largest continent—Asia—can be penetrated from its shores in a period no longer than two hours. The geographic center of the United States near Marysville, Kansas, is only 1½ hours distant from the Atlantic or Pacific at such flying speeds. Quoting E. M. Earle, "Our geographic position no longer offers its former great depth of defense—the security both of distance and of the buffer states of Western Europe —since air attack can be brought to us thru the stratosphere and without regard to distance and intervening neutral or belligerent territory. . . . The British Isles, so long an outpost of our security, may well be indefensible against the next aggression. This is not a

[4] F. V. B., in *Geographical Journal* 122:399, September, 1956.

pretty picture, but it is one that more nearly accords with the facts than the man-in-the-street is prepared to recognize or to grasp. And it is one to which the Congress of the United States should give more serious attention than it has thus far shown a disposition to give."[5] Newspapers of October 9, 1956, announced that experimental rocket-propelled flights of over 4,000 miles an hour are in prospect in about two years, or in other words, Atlantic City to Chicago in ten minutes. It begins to look as tho instantaneous flight from departure to destination might not be too far in the future. I doubt that any of us is prepared for it, either in the classroom or out.

In the face of these speeds and distances, it now appears that our attempts to expand the area of our continent artificially by arranging for airfields on foreign soil or by anchoring landing facilities in the open sea are futile in the extreme. Refueling of planes in the air materially reduces our need for larger numbers of fields, and with nuclear-powered aircraft we could maintain flight for extremely long periods without need of contact with the earth.

Weather disturbances of a magnitude great enough to interfere with air transport are almost wholly limited to the troposphere, below 50,000 feet. Above that height, planes are unaffected by storms or high winds. Thus the great heights at which it is now possible to fly have to a degree overcome the weather handicap that fliers faced in former years. But since planes must still take off and land on the earth's surface, and must necessarily traverse the troposphere, we will continue to need highly accurate and detailed information on disturbances in the lower atmospheric strata, making meteorology a prominent field of scientific research.

In preparing the manuscript for an Air Force text published in 1955, I included a statement that read as follows: "Aircraft movements will never be wholly unrelated to the earth's surface, and the competent and well-trained air officer must become thoroly aware of the basic facts of geography."[6] To me the remark was so obvious that it was hardly worth including. You may imagine my disquietude when, during the review of the manuscript, an Air

[5] E. M. Earle, in "Foundations of National Power," edited by H. and M. Sprout, New York, 1951; pp. 747-748.

[6] H. F. Raup, "Fundamentals of Global Geography," United States Air Force, Reserve Officers Training Corps, Montgomery, Alabama, 1955.

Force major challenged the first phrase as unacceptable. I replied, "But Major, planes will continue to take off and land on the earth's surface for a long time to come." He responded that he believed the time was near when that would no longer be true. So I pressed the point further to this effect: "Major, do you think that human beings may completely lose contact with the earth's surface, even to the extent of birth and death occurring at some distant point in space?" His point-blank reply, "Yes," aroused the only possible response: "This officer has been reading too much science fiction for his own good." But his challenge to my statement was seriously discussed at length by committee members while I sat by with an incredulous feeling about the whole affair. It was finally decided that the wording of the statement would be true until 1957 at the very least, and could remain in the text as it was originally drafted. I submit that if this is the type of thinking current among Air Force officers, we as geography teachers are many light-years behind them.

Air Power and Measurement of Time

For over a quarter century I have been doing my best to teach university freshmen that the earth is round; that its circumference is about 25,000 miles at the equator, so maximum speed of earth rotation is about 1,000 miles an hour at that latitude. In Atlantic City, the tangential speed of an object on the rotating globe at latitude 39° 21′ N. is 801.5 miles an hour—less than half our present top flying speed, and far less than speeds of the immediate future. And now we fly aircraft at twice the speed of rotation at the equator and we expect to fly at 4,000 miles an hour within the next few years. At these astronomical speeds, our present system of measuring time seems out of line with our needs. Measurement of time becomes meaningless when sustained flight toward the west exactly equals or exceeds earth rotation in speed—and we are now already far past that stage in aircraft and engine development. How long will it be until the whole concept of speed expressed in terms of earth rotation and miles an hour will be discarded in favor of more realistic measurements? I believe we are already in sight of that change, because with the achievement of subsonic and supersonic speeds, flight research has developed a system of measurement in which the speed of the craft is divided by the speed of sound; the resulting figure is called the Mach number, a useful

gauge of ultra-high speeds. A speed of Mach 1, for example, is equivalent to the speed of sound, or 760 miles an hour. Some similar system may be necessary in the future, even for land travel.

CONCLUSION

In conclusion, I believe we as teachers are guilty of inadequate attention to the more significant aspects of air power and aviation in relation to geography. I asked one of my students recently what contribution of commercial flight should be included in presenting the subject to a sixth-grade class. Her reply was, "Well, they ought to learn that we now bring orchids from Hawaii by plane." The revolution in short-distance urban transport by use of the helicopter; decentralization of vital industry as a result of threatened plant destruction by thermonuclear weapons delivered by air at supersonic speeds; these and other facets of our air-age existence go unnoted in the classroom. Why do we spend time studying transport on the Amazon River when commercial air loads of timber are flown up the eastern slopes of the Andes to reach west-coast markets, and oil well pipe reaches interior locations in Venezuela by helicopter? Aren't we still teaching in the wooden-shoes and igloo stage of geography?

To meet the challenge, it appears to me that textbook content concerning aviation should be checked to be sure that it conforms with modern needs and conditions. Teachers who lack backgrounds in air transport, both military and civil, should be urged to attend meetings in which the topic is discussed as a matter of interest to geographers. Teaching material on aspects of aviation is plentiful, and in fairness to the classroom students of our so-called "air age," we should use it. By this time, you may have reached a frame of mind to ask, "Just what is the impact of air power on geographic education?" To be blunt, I'm convinced that it is almost non-existent, but I maintain that to ignore the need for better education about the third great transportation facility is to deprive our students of a full appreciation of the age in which they live.

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PAPERBOUND BOOKS FOR THE TEACHER OF GEOGRAPHY

Lorrin Kennamer, Jr.
University of Texas

Within recent years the publication of inexpensive paperbound books has expanded into areas which should be of interest to teachers of geography. Some titles now in print pertain directly to geography while many more now available are generally related to the field. The use of paperbound books enables the teacher to expand his personal library rather inexpensively. The use of them also offers possibilities for expanding the classroom library at a relatively low cost. Also, some teachers have found that the paperbound books are valuable as outside reading material for the interested student.

Because geography is an integrative science the books in the following list have been selected from many fields in the physical sciences as well as in the social sciences. No claim is made that the list is all inclusive nor that all the books are of equal interest and utility. The list is furnished as an example of the type of material available.

The books are grouped under each publishing company with no significance given to the order in which they are listed. Contrary to the usual style the titles are listed first so that a scanning of books will be facilitated.

Bantam Books, Inc., 25 W. 45th St., New York 36, N.Y.

Venetian Adventure: Marco Polo. Henry Hart. 50¢
Man Against Nature. Charles Neider. 35¢

Penguin Books, Inc., 3300 Clipper Mill Rd., Baltimore 11, Md.

Geology in The Service of Man. Fearnsides and Bulman. 50¢
The Arabs. Edward Atiyah. 65¢
A History of Modern China. K. S. Latourette. 65¢
Iran. Rene Ghirshman. $1.00
Islam. A. Guillaume. 50¢
Prehistoric India. Stuart Piggott. 75¢
Semi-Precious Stones. N. Wooster. 95¢
Grasses, C. E. Hubbard. 65¢
Dictionary of Geography. W. G. Moore. 50¢
A Dictionary of Geology. G. W. Himus. 50¢

Metals in the Service of Man. W. Alexander Street. 65¢
The Origin of the Earth. W. M. Smart. 65¢
Everest is Climbed. Wilfrid Noyce. 50¢

New American Library of World Literature, Inc., 501 Madison Ave., New York 22, N.Y.

How to Know the Minerals and Rocks. Richard M. Pearl. 50¢
The Oregon Trail. Francis Parkman. 50¢
The Universe and Dr. Einstein. Lincoln Barnett. 35¢
Biography of the Earth. (rev.) George Gamow. 50¢
Birth and Death of the Sun. George Gamow. 50¢
The Crust of the Earth. Samuel Rapport and Helen Wright, eds. 35¢
How to Know and Predict the Weather. Robert M. Fisher. 35¢
Life on Other Worlds. H. Spencer Jones. 50¢
The Nature of the Universe. Fred Hoyle. 35¢
New Handbook of the Heavens. (illus.) D. A. Bennett, H. S. Rice, & H. J. Bernhard. 50¢
One Two Three . . . Infinity. George Gamow. 50¢
The Sea Around Us. Rachel L. Carson. 35¢
Under the Sea Wind. Rachel L. Carson. 35¢
The World of Copernicus. Angus Armitage. 50¢
Cultural Patterns and Technical Change. Margaret Mead. 50¢
Indians of the Americas. (abr.) John Collier. 35¢
Patterns of Culture. Ruth Benedict. 50¢
The United Nations and How It Works. David Cushman Coyle. 35¢

Academic Reprints, P.O. Box 3003, Stanford, Calif.

Observations on the Geology of the United States of North America. William Maclure. $1.25.

Rinehart Editions Reprint Series, Rinehart & Co., Inc., 323 Madison Ave., New York 16, N.Y.

The Discovery of the Great West: LaSalle. Francis Parkman. William R. Taylor, ed.

Anchor Books, Doubleday & Co., Inc., 575 Madison Ave., New York 22, N.Y.

The Explorers of North America, 1492-1806. John B. Brebner. $1.25

Littlefield, Adams, & Co.. 128 Oliver St., Paterson 1, N.J.

The Far East. C. A. Bain. $1.50.

Anvil Books, D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N.J.

Modern Japan: A Brief History. Arthur Tiedeman. $1.25
Contemporary Africa: Continent in Transition. T. W. Wallbank. $1.25

Sentinel Books, 112 E. 19th St., New York 3, N.Y.

Discover the Stars. Johnson & Adler. 75¢

Pocket Books, Inc., 630 Fifth Ave., New York 20, N.Y.

Rand McNally Pocket Atlas. 35¢
The Silent World. J. Y. Cousteau. 35¢

Dover Publication, Inc., 920 Broadway, New York 10, N.Y.

Uranium Prospecting. H. L. Barnes. $1.00

Harian Publications, Greenlawn, L.I., N.Y.

Air Routes of the World. $1.50
Travel Routes Around the World. $1.00

Alfred A. Knopf, Inc., 501 Madison Ave., New York 22, N.Y.

The National Parks. Freeman Tilden. $1.00

The R. R. Bowker Company, 62 West 45th Street, N.Y. 36, N.Y., publishes a periodic catalog of the paperbound books in print in this country which is available for a minimum price to individuals and libraries. This catalog has the titles arranged by subject area as well as by authors. The first section of it includes non-fiction and the last section includes fiction. For a listing of paperbound books from other countries information can be obtained from the Book Mail Service, Box 363, Jamaica, New York.

Annual Meeting
National Council for Geographic Education
St. Louis, Missouri
Jefferson Hotel
November 28-29, 1957

PLANNED INDUSTRIAL DISTRICTS

CAROLE WAGNER*
Graduate, Valparaiso University

Many cities and companies in the United States have planned and laid out new subdivisions in which people can live under favorable residential conditions. Results of such planned residential subdivisions have been mostly good.

As a result, a goodly number of cities and companies are now planning and laying out new subdivisions in which people can carry on manufacturing. The custom grew active about 1940. Results of such planned industrial subdivision, or organized industrial districts, are likewise mostly good. Therefore, such planning of industrial districts is growing. For example, a survey as of 1952-53† discloses that there then were in existence in the United States more than 120 planned industrial districts. They were located in and around 84 cities in 24 states.

The location of the organized industrial districts as of 1952 is shown in Figure 1. They are situated chiefly in the outer fringe of the cities and include heavy and light manufacturing and also distribution.

THE NATURE OF THE DISTRICT

An organized industrial district, like the above ones, is a piece of land which has been made ready, according to plan, for the sole use of factories. The piece of land may have been vacant when it was bought by the planners, or it may have been cleared of old buildings. After buying the land, the planners prepare it for factories.

The planners prepare the land by leveling it, draining it, by building streets and perhaps a railroad spur, by installing gas mains, water mains and electrical connections, and by other means.

After the land has been made ready, factories move onto it. Perhaps one big factory occupies the whole district. But commonly several kinds of smaller factories choose to start there because the land is ready and the costs are low. Some of them succeed. Cities like to have many kinds of factories. Thus the organized industrial district acts as a kind of mother of factories.

* With guidance by B. H. Schockel, department of geography and geology.

† *Organized Industrial Districts*, a Tool for Community Development, United States Department of Commerce, Office of Technical Services.

Based Upon a Map by United States Department of Commerce, Area Development Division

Who Are the Planners?

The planners of the organized industrial districts are not all alike. Sometimes one man buys land; next he plans it; and then he makes the land ready, which he calls developing the land. Sometimes several men join as a company and buy the land, plan it, and develop it. Such a company is called a corporation, perhaps a real estate corporation. In other cases a railroad corporation may own the land and develop it so that the railroad can get the business of carrying freight for the factories on the land. Finally, the entire town or city may own and develop the land, as a community project so that there will be more opportunity for work, more business for merchants, and more tax income for the city treasury.

Main Steps in a Project

Planners call their activities a project. The first step in an organized industrial district project is to decide whether the project will pay. The planners consider many items, such as cost of the land, the natural advantages of the land, transportation to and from the land, materials for the factories and markets for their manufactured products.

If the planners decide that the project will pay, they buy the land, and the next big step is to draw up plans for making the land ready for the factories. They prepare maps showing the proposed streets, the proposed sewage lines, railroad spurs, water mains, electric power lines, etc. Moreover, they prepare maps showing the size and shapes of the lots for the proposed factories and the grading to be done. Naturally, the lots will depend partly upon the kinds of factories which probably will buy the lots.

The planners must not forget zoning regulations because zoning regulations of a city do not permit factories which are undesirable owing to noise, smoke, fumes, danger, etc. Also some regulations insist on favorable features such as attractive buildings with landscaping and parking facilities.

After the plans are approved, the corporation makes a contract with construction companies which turn the plans into reality. This is called development, and thereafter the organized industrial district awaits factories.

To attract the owners of factories, some planners offer exceptional advantages in the industrial district. They study the needs and problems of each new factory and then take the complete responsibility for designing and erecting the buildings and providing financial aid. This type of coordinated service is called the Package Plan. It saves the factory owners the time and extra expense of hiring their own experts for each part of the investigating, planning, and construction process.

After the factories are built, the planners continue to function by enforcing zoning regulations and supplying maintenance services, special fire and police protection, banks, hospitals and clubs.

THE AIRLAWN INDUSTRIAL DISTRICT

Certain districts are represented on the map by large stars indicating the highest degree of planning. The 250 acre Airlawn District of Dallas, Texas, is one of these. It was developed cooperatively by the Missouri-Kansas-Texas railroads, private investors, landowners, and industrial real estate brokers.

Development began in 1938, and the district has been completely sold out to 40 companies which include light manufacturing, distribution, and food establishments. The success of Airlawn is due to (1) its location only four miles from downtown Dallas; (2) excellent cooperation between the land owners, the investors, and the

builders; (3) the creation of a Package Plan; and to (4) rigid restrictions.

At first, the restrictions were considered too severe. They included setbacks of 100 feet from the street, required cement or brick buildings, and purchase of sufficient land for off-street truck loading. Actually, these restrictions proved to be a great selling point. The owners of the larger and more stable factories of national importance wanted to maintain the property values of their investments. Speed and ease of transportation were increased by clearing the streets of loading docks. As a result of the successful planning, the district is not only efficient but also has a pleasant suburban appearance.

Benefits of the Districts

The planning and services offered by the planned industrial districts described in this paper have benefited the factory owners by making it easy for them to change location. Therefore, they are able to move to the places where they can have larger markets, cheaper materials, better transportation, and more workers—all or in part. In addition, the factory owners meet the increasing competition by expansion of facilities or by reducing costs thru modernization. The move to the suburbs not only gives the factories more room for expansion, but also helps them to escape the congestion of the cities and enables them to follow the government's recommendation to scatter essential industries for better defense measures.

The community benefits from the planned industrial district because the district attracts more and better factories which provide citizens with permanent jobs and satisfactory working condition. Moreover, the factories increase opportunities for business in the community. In addition, the city receives a large tax income from the district which previously had paid little taxes or had lain idle. Also, planning helps to keep the residential sections separate from the industrial and the business sections. Thus the values of homes will remain high, and traffic will be less crowded.

Industry and the community are interdependent. The planned industrial district has brought this relationship to a high degree of development for the benefit of both.

A TEACHING EXPERIMENT IN GEOGRAPHY

ROBERT F. PERRY
Miami University, Oxford, Ohio

Many problems were created by the great influx of school-age children into the secondary schools in the 1950's. These problems are already being passed along to the colleges and universities of the country. The private schools are able to select students and to limit enrollment as they choose. Thus, much of the burden of increased enrollments falls into the laps of the state supported colleges and universities. Miami University, a state university in Ohio, is one of those which is searching for a solution to some of the many problems created by the highest enrollment in its history. The number of students next year is expected to be even greater than the present 5600 and it is expected to double by the early 1960's.

Housing is a basic problem here and the university is attempting to keep pace with enrollment growth by the addition of new dormitory buildings. However, another significant problem and one which is less readily solved is concerned with the student-teacher ratio; i.e. can the present faculty, with few additions, handle the anticipated influx of students? With a grant in aid from the Fund for the Advancement of Education, this university has undertaken several teaching experiments, some of which are designed primarily to determine whether or not a professor can handle more students per class than at present without any loss in teaching effectiveness.

Radio, television and other media have been used in this experiment by some departments in an effort to reach more students. The Department of Geography, however, in its beginning course, *Essentials of Modern Geography,* has made a comparative study among its students with this same aim in mind. Six sections of the beginning course were involved in the study. Three of these were small "control" sections, limited to thirty students, which met for three one-hour periods per week. This, incidentally, is the way the department has been accustomed to teaching most of its courses. The other three sections were large "lecture" sections, limited to one hundred and twenty five students, which met for two one-hour lectures per week. For their third weekly meeting these large lecture sections were each divided into four "recitation" sections

of approximately thirty-one students. Some of these recitation sections were taught by graduate teaching-assistants, others by the lecturing professor.

Sophomore students were used in the experimental study and their final examination results were the basis of comparison. Students of the small control groups were matched with those of the lecture groups on the following: 1) the results of Cooperative English and Mathematics Tests, both of which were given prior to entrance; 2) total score on the American Council on Education examination given after a few weeks on campus; 3) grade point average for the first year; and 4) I.Q. Three professors, Dr. Henry M. Kendall, Dr. John L. Thompson, along with the author each taught one of these lecture groups and one of the control groups.

The following results were obtained on the final examination, which was the same for all students taking the course regardless of section or instructor:

	Average of all Control Sections	*Average of all Lecture Sections*
Students with High Ability (Upper 50% of class)	81.59%	83.81%
Students with Low Ability (Lower 50% of class)	75.63%	76.11%
Total	78.54%	79.83%

Statistically, there was no significant difference between the examination results of the students in the large lecture groups and the students in the small control groups.

At the conclusion of the course, a questionnaire from each student was obtained to gain his or her attitude toward: 1) the course, 2) the instructor, 3) the large versus the small classes. The results showed that:

1. Altho students do about as well in one section as they do in the other, they *think* they learn more in the small control sections.
2. The small classes are preferred by the majority of the students. They feel they have closer contact with the professor.
3. Attention in class as well as attendance is better in the small classes.
4. The professors engaged in the experiment are above average in teaching ability (student opinion, based on comparing these professors with their other professors).

Altho the experiment has not been completed, it seems to this

individual, that it is, indeed, fortunate that tentative results show that a good lecturer with the proper visual aids can be as effective in teaching large groups as in teaching small groups of a beginning geography course. Perhaps this is a possible solution for the teaching of more students in the future by a single geography professor and his graduate assistants.

REPORT OF THE 42ND ANNUAL MEETING OF THE NATIONAL COUNCIL OF GEOGRAPHIC TEACHERS

JOHN W. MORRIS, SECRETARY

Approximately 275 members and guests attended the 42nd annual meeting of the National Council of Geography Teachers held in the Claridge Hotel, Atlantic City, New Jersey, on November 23-24, 1956. At this meeting were geographers from 37 states and 4 foreign countries which included Canada, Netherlands, Mexico, and Chile. The largest number of registrations were from the New Jersey-Pennsylvania-Maryland area. A breakdown of the registration indicates that approximately half of those in attendance were classroom teachers in elementary and secondary schools. Others included college and university teachers, geographers from government agencies, and those from the editorial staff of publishing companies as well as administrators, supervisors, graduate students, and colleagues from other social studies fields. The general theme of the meeting was an extremely timely one, namely "Improving Geographic Education to Meet America's Needs." The theme was well developed in both the general and sectional sessions.

The program provided for four general sessions and seven sectional meetings arranged for groups of special interest. The first general session was called to order with Norman Carls, President of the National Council, presiding. The official welcome was given by Mr. Ablett H. Flury, Assistant Commissioner of Education, State of New Jersey. Following this welcome three excellent addresses keynoting the overall theme of the meeting were presented. Such topics as "The Impact of Air Power on Geographic Education," and "Improving the College Training of Geography Majors," were discussed.

The 2nd general session carried out the theme, "What Can Geography Do for Me?" This session was presided over by Mary Viola Phillips, Second Vice-President. Papers and talks were presented by high school and college students on the subjects of "Importance of the Study of Geography to Youth," "Preparing for a Teaching Career," and "Understanding Life Through Geography." This program was extremely interesting and refreshing because of the enthusiasm with which it was presented and the freshness of the point of view.

The 3rd and 4th general sessions carried out the theme, "Improving the Use of Globes and Maps," and "Geographic Education in Integrated Programs" respectively. The 4th session was held Saturday, November 24, as a joint meeting with the National Council for the Social Studies.

The State Coordinators' Luncheon was well attended. Herbert H. Gross, Director of Coordinators for the National Council, presided. The program was entitled "Reports from Rio" and was given by two members who had been in attendance at the meeting of the International Geographical Union in Rio de Janeiro.

The Banquet was attended by approximately 225 members and guests, with Norman Carls presiding as the toastmaster. The address was given by Benjamin Cohen, Under-Secretary of the United Nations. His subject was "United Nations' Geopolitical Concepts." Mr. Cohen's address was extremely well received and was of special interest to teachers of geography, since he pointed out the extreme shortage of qualified personnel in this field.

Preceding the address, the Distinguished Service Award Citation was read by Zoe A. Thralls. The Award was presented posthumously to George Renner for his outstanding contributions to the field of geography thruout his many years of service at Columbia. The Award was received by his son, George Renner III, professor of geography at Tempe State University.

For several years it has been the custom of the Council to honor some geographer, who thru the excellence of his articles published in the Journal of Geography, has made a contribution to the advancement of geographic education. It is customary to alternate this Award, one year the recipient being an elementary teacher, the next year a high school teacher. This year Abraham Resnick, a high school teacher in New Jersey, received the Award for his article, "A Unique Study of Cities."

Minutes of the Tenth Annual General Assembly

At 10:45 Saturday morning, November 24, 1956, the Tenth Annual General Assembly met for the business session.

The Secretary reported that membership in the Council as of November 1, 1956, totaled 1,427, of which 64 members are outside the continental limits of the United States. The Council has at least one member in each of the forty-eight states and the District of Columbia. Pennsylvania led in number of members followed by Illinois, New York, and California. During the past year many of the states west of the Mississippi have had considerable increase in Council membership. During 1956 the annual turnover in membership was about 200, but new members more than offset the losses, giving the Council a small gain in total membership over the previous year. The Council now has 722 Fellows, 75 being added to the list since November 1, 1955.

In the absence of the Treasurer, the report was read by the Secretary. The Treasurer presented a statement from Arthur A. Winakor, CPA of Champaign, Illinois, who certified the funds of the organization to be in a very satifactory condition. At the present time the Research Fund has a cash balance of $3,729.71 plus $5,000 invested in United States' Bonds.

The report of the Committee on Amendments to the Constitution was presented by Zoe A. Thralls. It was moved and seconded that the name of the organization be changed from the National Council of Geography Teachers to National Council for Geographic Education. The change in name was approved by a three to one vote. Miss Thralls then presented the Amendments to the Constitution to the General Assembly and they were also approved.

The report of the Planning Committee was presented and approved. (A copy of the report of the Planning Committee is attached.)

The report of the Resolutions Committee was read by Loyal Durand, Chairman. The report was approved unanimously. (Copy of Resoultions is attached.)

At the close of the business session the following officers were elected for the year 1957:

President, Ina Cullom Robertson, State Teachers College, Valley City, North Dakota

First Vice President, Mary Viola Phillips, Senior High School, New Kensington, Pennsylvania

Second Vice President, John C. Finney, Anderson Senior High School, Anderson, Indiana
Secretary, John W. Morris, University of Oklahoma, Norman, Oklahoma
Treasurer, John H. Garland, University of Illinois, Urbana, Illinois
Director of Coordinators, Herbert H. Gross, Concordia Teachers College, River Forest, Illinois

RESOLUTIONS PRESENTED AT TENTH ANNUAL GENERAL ASSEMBLY

1. *Whereas* the forty-second annual meeting of the National Council for Geographic Education at Atlantic City, New Jersey, on Friday and Saturday, November 23 and 24, 1956, has been a productive, an educational, and a pleasant experience for the members and guests in attendance.

Therefore be it Resolved that the many who have worked so long and diligently to make the arrangements and to make the meeting a success be thanked by the membership, and through their chairman, and that the National Council for Geographic Education express particular appreciation to the following:

Norman Carls, President
Helen Mixter, General Chairman of Local Arrangements
Edward Biller, Chairman of Local Publicity
Katherine Stritehoff and Kathryn Scott, Co-Chairmen of Registration
Berenice Casper and Jessie Turk, Co-Chairmen of Hospitality
A. K. Botts, Chairman of Field Trips
Evelyn C. Hightower and Marie Remmert, Co-Chairmen of Banquet and Luncheon

and

2. *Whereas* the physical and meeting arrangements at the Atlantic City meeting have been excellent.

Therefore be it resolved that the membership of the National Council for Geographic Education express its appreciation to the management of the Hotel Claridge, to our exhibitors, to the aforesaid local arrangements committee in *toto,* and to our national officers and Executive Board.

and

3. *Whereas* some of our members who have given devoted service to geography and to geographic education have died during the past year.

Therefore be it Resolved that the National Council for Geographic Education express its feeling of loss with the passing of Merna Irene Fletcher, long-time member of the National Council and the Missouri Council of Geography Teachers, of Ann McComb of Holly, Colorado, of Dr. H. F. Swansen of Blair, Nebraska, and of Harriet Carter, who served the profession at Winona State Teachers College, Minnesota, and the Frick Teacher Training Institute of Pittsburgh, Pennsylvania

and

4. *Whereas* the understanding of the geography of the world, its continents, oceans and seas, countries, and regions is of continuing necessity and importance in the modern interdependent world

Therefore be it Resolved

a. That the National Council for Geographic Education is on record that students of all educational levels be given every opportunity to achieve geographic understandings of the world in which they live;
b. That, in order to achieve this objective, the National Council for Geographic

Education continue to work for geographic education in the schools, colleges, and universities;

c. That the National Council for Geographic Education should promote the teaching of geographic concepts and understandings at all educational levels not only where geography *per se* is taught, but also where it is correlated or integrated with other subjects;

d. That the National Council for Geographic Education should work toward having geography taught by competently trained teachers *as a separate subject;*

e. That any teacher who handles geography materials should have competent training in the subject;

f. That the National Council for Geographic Education expresses its willingness to meet concurrently with any professional organization to implement the preceding items.

Respectfully submitted,

LOYAL DURAND, JR., *Chairman*
GEORGE HOFFMAN
ALAN P. MEWHA
(EMILY H. BAKER)—absent

REPORT OF THE PLANNING COMMITTEE TO THE GENERAL ASSEMBLY
NATIONAL COUNCIL FOR GEOGRAPHIC EDUCATION

The Planning Committee whose members are the three most recent past Presidents, the President, the Secretary, and a chairman elected by the Board met on Thursday to study present needs and to recommend to the Executive Board plans and areas for consideration and action.

The items as received by the Executive Board are:

1. The Committee on Tests—Miss Casper, Chairman
   It is recommended that:
   a) The Committee on Tests be authorized to study the set of Social Studies tests recently prepared by the Educational Testing Service of Princeton with a view to making recommendations for alterations that will make these tests meet the requirements for geography education and, furthermore, that the committee be authorized to offer the same service to other companies producing tests in geographical material.
   b) The Committee on Tests be requested to prepare a brochure for the "How To Do It" series in which they will indicate the objectives and coverage desirable for geographic testing at each of four educational levels—primary, intermediate, junior high, and senior high—together with sample questions illustrating coverage and techniques of testing.
2. Publication "Careers In Geography"
   The Committee recommends that the Executive Board:
   a) Appoint a committee to prepare a small leaflet type of publication on "Careers In Geography," which can be made available for distribution to high school and college guidance and careers councilors, and
   b) Prepare additional data of more detailed nature identifying the nature of jobs available in geography, names of geographers holding non-teaching positions requiring geography training, pay available, and similar material important to student councilors. This data would be reproduced in mimeographed form and distributed thru the office of the Secretary.
3. Geographic Education Service Center
   The Planning Committee recommends that the Executive Board authorize the

President to make contact with the President of the Association of American Geographers with the object of cooperating with A. A. G. in the establishment of a Geographic Education Service Center.

4. Geography Bulletin
   The Planning Committee recommends that the Executive Board decide to publish a book comparable to a yearbook on materials pertinent to geography education, and that the Executive Board establish committees necessary to the initiation of this project this year.
5. Bonus Publications
   The Planning Committee recommends that the Executive Board authorize the Secretary, Dr. Morris, to dispense certain excess or out of date publications as bonuses for new members and for general publicity purposes.
6. Local Arrangements Handbook
   The Committee recommends that the Board appoint a committee whose responsibility will be to prepare a manual on Local Arrangements for Annual Meetings of the Council.
7. Exhibits of Student Projects
   The Committee Recommends that the Board establish a committee to examine and evaluate the possibility of conducting local and national projects involving competitive exhibits of student-made items with geographic significance, to be considered by the committee. Such a committee to report at the next annual meeting.
8. How To Do It Series
   The Committee regrets that work on this project must remain in abeyance while Miss Anderzhon is abroad. They recommend that the records of the reporters' notes of the sectional meetings of this convention be sent to Miss Anderzhon with the suggestion that she name at least one author and editor to prepare the material for publication as a brochure in the How To Do It Series.

Respectfully submitted;

ADELBERT K. BOTTS, *Chairman*

THE NATIONAL COUNCIL AT WORK

DISTINGUISHED SERVICE AWARD COMMITTEE

The Constitution of the National Council for Geographic Education defined the duties of the Distinguished Service Award Committee as follows:

"The Award Committee may make and receive nominations for the Distinguished Service Award. Any member of the National Council for Geographic Education may send a nomination to said committee. Such nominations must be accompanied by a full statement of the service rendered geographic education by the nominee.

"The Award Committee shall have full authority by unanimous consent to select the one upon whom the Distinguished Service Award is to be conferred, except that not more than one award shall be conferred in the same year without the approval of the Executive Committee of the National Council."

The Committee members for 1957 are Howard Martin, University of Washington, Seattle, Washington, Alfred H. Meyer, Valparaiso University, Valparaiso, Indiana, Melvina Svec, State Teachers College, Oswego, New York, Nora Zink, State Teachers College, Indiana, Pennsylvania, and Katheryne T. Whittemore (Chairman), State Teachers College, Buffalo, New York.

Ina Cullom Robertson and John W. Morris serve as ex-officio voting members of the committee.

KNOW YOUR ORGANIZATION

If you have read the December and January issues of the JOURNAL OF GEOGRAPHY, you will know that the National Council of Geography Teachers has changed its name to that of the National Council for Geographic Education. I want to keep this fact before you until we get used to using our new title. The new name became official by unanimous vote of the General Assembly at the meeting of the National Council in Atlantic City, New Jersey, November 24, 1956. This is an historic date.

Some of you may be asking the reason for this change of name. To answer the question briefly, the Executive Board in discussing the matter, thought that, among other things, it broadened our base for membership. In the past many people have wrongfully assumed that one must be a "teacher of geography" to belong to the National Council. This never was the case. Under the new title this misconception is clarified, in the opinion of the Executive Board, and anyone interested in geographic education is eligible and more than welcome into membership.

TEN QUESTIONS

How long has it been since you read the constitution of our organization? Get a copy from the Secretary and answer the following ten questions in order to test your knowledge of your organization.

1. What are the objectives of the National Council for Geographic Education?
2. Who are the officers and how is the organization governed?
3. What is the difference between an annual and a contributing member? When does one become a "Fellow"?
4. What is the difference between an associated and an affiliated organization?
5. When does a member become eligible for election to a national office or to the Executive Board?
6. What are the specific duties of the elected officers?
7. What is the function of the Executive Board? The General Assembly?
8. Who makes up the Executive Board? The General Assembly?
9. What the the permanent committees set up by Executive Board and what are their duties?
10. What is the official organ of National Council for Geographic Education?

ANNUAL MEETING OF THE NATIONAL COUNCIL FOR GEOGRAPHIC EDUCATION

Have you ever attended an annual meeting of the National Council? If not, why not? The next annual meeting will be held in St. Louis on November 29, 30, 1957. Plan now to attend. Let us make this first annual meeting of National Council for Geographic Education the biggest and best ever.

Many members have sent to the president excellent program suggestions. This is your organization and your president will be glad to hear from you.

In the ensuing months watch for and read the page: THE NATIONAL COUNCIL AT WORK. An informed membership is essential to a live organization. Know your organization.

INA CULLOM ROBERTSON, *President*

ESSENTIAL TASK IN THE TEACHING OF GEOGRAPHY IN INSTITUTIONS OF HIGHER LEARNING

Plan to attend the joint meeting of the Association of American Geographers and the National Council for Geographic Education to be held at the Netherland Hilton Hotel, Cincinnati, April 1-3.

The discussion of this subject will be under the direction of Henry J. Warman and the panelists will include Arch C. Gerlach, Clyde F. Kohn, Louis O. Quam, and Ina Cullom Robertson. The chief discussant will be Norman J. Carls. The following will provide the basis for discussion:

1. Understandings which the undergraduate major in geography should attain.
2. Tools and techniques which the undergraduate major in geography should develop.
3. Research courses and research techniques in geography.
4. Courses devised for undergraduates who are not now majoring in geography, but who want an introduction to the field—that is, college of liberal arts students.
5. Courses devised for specific undergraduate students in other branches of the university—courses for students in Commerce: courses for students preparing to teach in the elementary school: courses for students preparing to teach in the high school; advanced courses for those aspiring to teach at levels higher than high school.
6. Integrated courses in which geographic understandings are taught along with learnings in other social sciences—or the physical sciences—courses such as we have here in Modern Society (economics, political science, and geography) course such as Earth Science.
7. Courses in geography designed to meet a physical science requirement.

Other topics to be discussed that will be of interest to all who are concerned with geographic education include:

1. Criticism of Visual Aids as Employed at our National Meetings
2. Problems of Undergraduate Geographic Training: The Non-Professional Curriculum
3. Purpose of Cartography in Geographic Writing

Headquarters will be the Netherland Hilton Hotel; however, there are other hotels near at hand.

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William L. Thomas, ed. **Man's Role in Changing the Face of the Earth.** University of Chicago Press, Chicago, 1956. 1231 pp. with 180 illustrations, bibliographies, and index. $12.50.

In June 1955 about 50 invited experts from four continents gathered to discuss many aspects of what man has done to change the earth, and the prospects for the future. This volume includes 54 chapters, each an abstract of what the writer has learned as a result of many years of research on his subject. These well-documented chapters are supplemented by reports of comprehensive "discussion sessions," and by "summary remarks" by the co-chairmen, Carl O. Sauer, Marston Bates, and Lewis Mumford. Some topics extensively treated historically are the influences of fire, of deforestation, of soil erosion, of tillage, of irrigation, of mining, of urbanization and of the destruction of native plants and animals. The 200 pages devoted to forecasting the future include many highly thought-provoking statements.

Many of the chapters will yield much value to geography teachers and interested pupils, even some in the upper grades. Examples are the editor's introduction; the co-chairmen's introductions and summaries; R. J. Russell's account of floods, earthquakes, coastal and river changes, and storms; Klimm's Man's Ports and Channels; Albrecht's on soil, C. D. Harris' on residential vs. industrial land use; Harrison Brown's forecast of the future sources of power and minerals; and the symposium discussion on man's prospects. The volume ends with an inspiring statement by Lewis Mumford, distinguished for his work on city planning, on the need for greater appreciation of nature and of other people—for more "love."

This massive but relatively inexpensive, encyclopedic volume merits a place in all sizable school and public libraries, and it could advantageously be owned by all teachers of conservation, geography, sociology, and history.

STEPHEN S. VISHER

Indiana University

Census Atlas Maps of Latin America. U. S. Bureau of Census, U. S. Department of Commerce, Washington 25, D.C.

The U. S. Bureau of Census in cooperation with the International Cooperation Administration is directing and aiding in the preparation of reports for several Latin American countries. The reports contain many excellent maps that should be of inestimable value to all geographers. These maps will cover not only relief features, climate and natural vegetation, but population distribution. The Census Atlas for El Salvador should be available soon. The one on Costa Rica has already been published.

Part I, *Central America*, contains maps on land forms, climate, natural vegetation, roads and railroads, and urban and rural population maps of Guatemala-British Honduras, Honduras and El Salvador, Nicaragua, Costa Rica and Panama.

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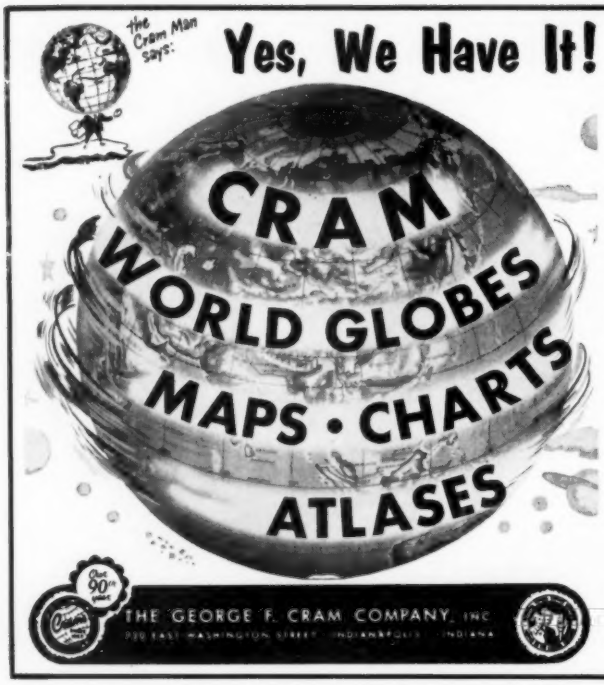

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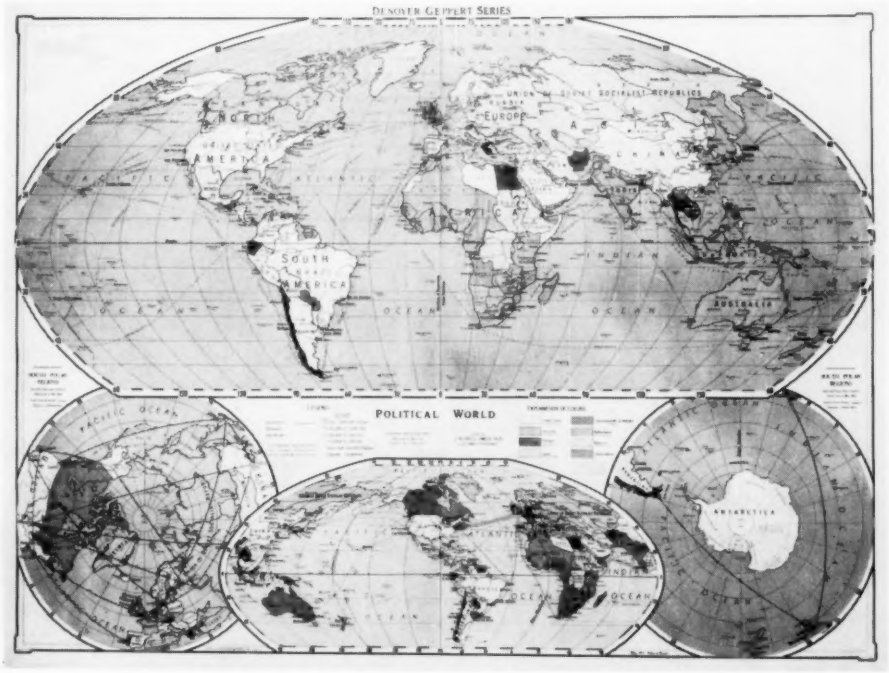

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